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DISEASES OF THE NERVOUS SYSTEM

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

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VOL. XIII MAY 1952 No. 5

Published monthly by
PHYSICIANS POSTGRADUATE PRESS
277 Broadway, New York 7, New York

EDITORIAL OFFICES
UNIVERSITY OF TEXAS SCHOOL OF MEDICINE
800 Avenue B., Galveston, Texas

Entered as second-class matter at the Post Office at New York, N. Y.

DISEASES of the NERVOUS SYSTEM

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

Differential Diagnosis of Epilepsy and Hysteria

(Follow-up Study of 36 Cases)

WALTER I. TUCKER, M.D., and
MILTON GREENBLATT, M.D.
Boston, Massachusetts

Patients who have atypical spells associated with various emotional reactions often constitute a problem in the differential diagnosis of epilepsy and hysteria. We have undertaken a one to three year follow-up study on 36 cases of this type. All 36 patients had electroencephalograms at the original examination and 23 had repeat electroencephalograms at the time of follow-up. They were all examined clinically by the first author (W.I.T.) and the electroencephalograms were all interpreted by the second author (M.G.). Diagnoses were made at the time of the follow-up on the basis of the total clinical picture, considering the electroencephalographic findings, the types of spells, the response to medication, and emotional factors. Fifteen patients were considered to have epilepsy, 18 patients to have hysterical attacks and three patients to have both epilepsy and hysteria.

Electroencephalographic Findings

For the group as a whole, the electroencephalograms were on the abnormal side statistically. Nineteen were reported as definitely abnormal or consistent with epilepsy in at least one tracing. Minor irregularities occurred in at least one tracing in eight, and nine were normal.

Furthermore, of 23 patients having two tracings, six showed a change from "normal" or "minor irregularities" on the first tracing to "definitely abnormal" on the second, and two showed change from "normal" to "minor irregularities." Five of the six patients in the "definitely abnormal" group were considered clinically to have epilepsy.

Two patients showed an improvement in the electroencephalogram from "abnormal, consistent with epilepsy" to "mildly dysrhythmic," and in both there was also clinical improvement in the occurrence of spells.

Of the 19 cases in which the electroencephalogram was "definitely abnormal" or "consistent with epilepsy" a clinical diagnosis of epilepsy alone was made in 11 (Table 1). Three patients were considered to have both hysteria and epilepsy. The remaining five were considered to manifest hysterical or other neurotic reactions and in this group the hyperventilation syndrome was frequently found.

TABLE 1

	EEG		*Epilepsy*	*Hysteria*	*Epilepsy and Hysteria*
Abnormal	19		11	5	3
Minor irregularities	8	17	4	13	0
Normal	9				
Total	36		15	18	3

Of the 17 cases in which the electroencephalogram was normal or showed only minor irregularities on both tracings, four

From the Lahey Clinic (Department of Neuropsychiatry), and Boston Psychopathic Hospital.

were considered to have epilepsy and 13 not to have epilepsy. The diagnosis of epilepsy was made on these cases with normal electroencephalograms, according to the criteria of Abbott and Schwab,[1] that is, there was a clear clinical description of typical attacks, a response to anticonvulsive drugs, no other intrinsic pathologic change was found and no other condition suggested.

Another finding of significance in the electroencephalogram reports was that five patients showed definite abnormalities in the tracing with hyperventilation, with essentially normal records except for the response to hyperventilation. In none of these patients was a clinical spell produced by hyperventilation during the electroencephalographic recording.

The following is a brief case history of a patient with an abnormal electroencephalogram who was not considered to have epilepsy clinically.

Case 1. This 23-year-old single woman had complained of vague spells for two years prior to her first visit to the clinic in July 1946. The spells consisted of numbness of one leg or arm or both, tightening in the throat and difficulty in swallowing and breathing, severe tremors of the entire body, and at times she was unable to talk. The right side was more often involved. There had not been any unconsciousness or injury during the attacks. Her brother developed epilepsy following meningitis and his spells induced difficulty in swallowing and unconsciousness.

The general physical and neurologic examinations were normal and a roentgenogram of the skull was normal. The electroencephalogram showed abnormal fast activity of 18 to 24 per second, with episodes of 4 to 7 per second throughout. There was marked overbreathing build-up with high voltage 4 to 6 per second activity in episodes bilaterally and diffusely. No focal abnormality was noted. The tracing was considered to suggest epilepsy.

There was a background of instability. The attacks began after the brother developed epilepsy, and frequently occurred after he had an attack or when she was emotionally upset. She was fearful that she would become like her brother. It was probable from the history that hyperventilation occurred with a spell.

Because of the electroencephalographic report Dilantin and Mebaral were tried but the patient showed no improvement. She did improve after discussion and definite reassurance regarding her condition, even though anticonvulsive medication was discontinued.

When again seen thirty-four months later she had had no spells similar to the previous ones. She did tend to become occasionally "short of breath" when nervous or upset, and at these times was likely to have periods of shaking, trembling and crying. She had married in the interim and was making a satisfactory adjustment.

The patient was not able to cooperate well in hyperventilating and only tremulousness was produced. She was not able to continue hyperventilating during the repeat electroencephalogram, and only muscle artefact was noted. The tracing was reported as an irregular medium voltage fast type with scattered 7 to 8 per second and alpha waves posteriorly. No focal abnormality was noted. It was considered a mildly dysrhythmic tracing and showed improvement over the previous tracing.

Types of Spells

When a reliable description was obtained of typical grand mal convulsions, the diagnosis of epilepsy was usually confirmed by the electroencephalogram pattern and the response to medication. Some patients, however, had typical grand mal attacks at times, and at other times had attacks which were not at all typical and suggested hysterical reactions.

There were 10 patients in this series whose spells were described as originating in or confined to one side. Seven of these had abnormal electroencephalographic records and six showed amplitude asymmetry. Pneumoencephalograms were carried out on four but in none was any evidence found of a focal lesion. In only four of these patients was a clinical diagnosis of epilepsy made, and the rest were considered to have primarily hysterical attacks, often with hyperventilation. These cases constitute a particular problem because the presence of a focal lesion may have to be ruled out. The following is an example of this type of case.

Case 2. This 19-year-old single girl was first seen in December 1947, with complaints of spells for the last two months. These were described as sudden episodes of fainting in which she fell to the floor and did not respond for two to five minutes. There was movement of the arms and legs, beginning with the left arm, but not suggestive of convulsive movements. It was said the left side was paralyzed for a short time after a spell on one occasion.

There was a history of epilepsy in a cousin following a head injury. The patient had no history of head injury but a background of emotional instability.

The general physical examination was normal. The neurologic examination showed absence of left knee and ankle jerks and an equivocal Babinski. A roentgenogram of the skull was normal except for left frontal endostosis. The electroencephalogram

was reported as an irregular low voltage tracing with mixed fast and 11 per second frequencies. There was no change with hyperventilation and no focal abnormality. Because of the type of spells and indefinite neurologic findings an oxygen encephalogram was done which was reported as normal. She did not respond to anticonvulsive medication and continued to have spells about twice weekly.

There were several interviews during which it became apparent that the patient was very immature. She always became easily upset emotionally and the spells usually occurred at times of emotional stress. She had particular fears regarding any sexual contact, and refused to go out with a boy again if he tried to kiss her. There had been several episodes in her neighborhood in which a prowler broke into a girl's room. This had occurred prior to the onset of her spells, and she displayed a great deal of fear that something of the sort might happen to her.

After some discussion of these fears, and reassurance, the spells ceased and did not recur when medication was discontinued.

She has had no spells for eighteen months, and has made a reasonably good adjustment but remains immature and unstable. There was during this time a period when she complained of breast pain and fear of cancer, which seemed related to a problem with her boy friends. This cleared up after discussion of the problem and reassurance.

A repeat electroencephalogram was done in August 1949 which showed no change except for some amplitude increase on overbreathing.

A history was obtained in 11 of the patients which indicated that hyperventilation occurred prior to the attack, associated with acute anxiety or hysterical symptoms. Of the 11 patients with probable preceding hyperventilation 9 were considered clinically not to have epilepsy.

Two patients were seen who had a history of hyperventilation and who had a spell with apparent alteration of consciousness occurring during hyperventilation at the time of the electroencephalographic recording. In each of these cases there was no definite change in the electroencephalogram during the spells which were not considered to be epileptic. A brief case history of one of them follows.

Case 3. This 15-year-old girl had a head injury followed by unconsciousness for five minutes, and residual symptoms of headaches and postural dizziness. Seven weeks later she began to have spells with ringing in the ears and then would suddenly slump into a chair or onto the floor. At times there were thrashing movements of the arms and legs and at other times she stated she could not move for several minutes although she was conscious of what was going on. Her doctor was treating her for epilepsy.

The physical and neurologic examinations were normal. Hyperventilation produced a typical spell in which the patient slumped but did not fall and recovered in ten seconds. The electroencephalogram was normal and though she had 2 typical "spells" during hyperventilation there was no change in the record.

It was later found that there was a clash with one of the teachers in school and the family had been greatly overconcerned and overprotective since the head injury. When these problems were better adjusted, and following reassurance, she did not have any more spells, although no medication was taken. There was occasional headache, dizziness and fatigue. Diagnoses were made of posttraumatic syndrome, hyperventilation syndrome and hysteria.

Response to Treatment

Definite decrease in the occurrence of spells on anticonvulsive medication and recurrence of the spells on withdrawal of medication was considered evidence of epilepsy. When it was not possible to make a definite diagnosis on the basis of the description of the spells, the electroencephalogram, and the preliminary appraisal of emotional factors, it was found necessary to institute trial treatment. In some cases it was not possible to establish reasonably the diagnosis without such a trial.

If there was no effect, or only temporary improvement, from anticonvulsive medication, it was concluded that we were not dealing primarily with epilepsy or with epilepsy alone.

A number of patients showed no permanent improvement on anticonvulsive therapy, and were later found to have specific emotional conflicts which were dealt with and then had no recurrence of spells after medication was discontinued. Such patients were classified as not having clinical epilepsy at present, even though the electroencephalogram may have been reported as abnormal. This is illustrated by Case 2.

Emotional Factors

These patients were selected for study because emotional factors seemed important on the original examination. Consequently, almost all patients were found to have some emotional component to their illness.

Patients in whom a diagnosis of epilepsy alone was made frequently seemed to have spells precipitated by emotional stress. They often had anxiety, particularly social anxiety, and instability. It was common to find an increase in the frequency and severity of attacks associated with severe environmental stress.

Patients in whom a diagnosis of epilepsy could not be established tended to have typical hysterical personalities with marked immaturity or severe emotional instability with hyperventilation. A diagnosis of epilepsy and hysteria was made on three patients with these personality characteristics.

Comment

It is immediately apparent that this group shows a very high incidence, 75 per cent, of electroencephalograms in which there was some abnormality, even though clinical epilepsy was established in only 50 per cent. The incidence is almost as high as in a group of patients in whom the diagnosis of epilepsy has been established. Many patients had an increase in abnormality in the second tracing as compared to the first. Several showed abnormalities in the electroencephalogram consistent with epilepsy, although the diagnosis of epilepsy could not be established clinically. The question is whether in the course of time clinical epilepsy will become established in some patients, even though it is not possible to make such a diagnosis now. The electroencephalographic findings suggest this.

Even after thorough study and follow-up, it was not always possible to make a clear distinction between hysteria and epilepsy, and it could only be concluded that in some patients both conditions may be present. Other patients have cerebral dysrhythmias and spells resembling epilepsy, occurring only with hysterical or anxiety episodes and apparently associated with hyperventilation. When the emotional adjustment is improved and the neurotic reactions no longer occur, the spells may disappear. It is possible that epileptic patients reported by others as having been cured by psychotherapy may be of this type. Whether one should call this type of case epilepsy is a matter of definition, but we have not classified it as such.

There is evidence clinically from the patients studied and to some extent from the electroencephalograms that hyperventilation may tend to precipitate spells resembling epilepsy in susceptible individuals, and so at times may constitute a link between emotional factors and the physiologic reaction of a spell.

It has been shown by Brazier, Finesinger and Schwab[2] that the response to hyperventilation and the effect on the electroencephalogram vary considerably with several factors, particularly with the blood sugar level, but the response also varies with the depth of breathing. It is found clinically that it is not always possible to get patients to indulge in really deep breathing at command, even though they have a definite history of hyperventilation. Furthermore, spontaneous hyperventilation occurs under conditions of severe anxiety and hysterical excitement, presumably with marked autonomic overactivity, and this may well result in a different physiologic reaction. Some experimental evidence in support of a relationship between autonomic activity and the response to hyperventilation is contained in the report of Darrow, Pathman and Kronenberg.[3] They found a correlation between electroencephalographic changes during hyperventilation and strong sympathetic tone, as evidenced by skin conductance and heart rate. Gibbs, Gibbs, Lennox and Nims[4] have shown that the ease with which slow waves can be produced by hyperventilation is a rough index of the relative incompetence of the vasoconstrictor response to low carbon dioxide tension. Ichinose[5] has shown an inverse relationship between the degree of autonomic nervous tension (measured by the blood pressure, pulse and other autonomic signs), and the percentage and regularity of alpha activity in the electroencephalogram.

From our observations we have reached a conclusion that it is not always possible to make a clear distinction between hysteria and epilepsy. Hyperventilation appears at times to be a precipitating factor in the occurrence of spells, but spells cannot usually be produced by voluntary hyperventilation. There are cases of epilepsy in which a spell may be produced by hyperventilation. There are cases of hysteria in which hyperventila-

tion may produce a spell without any corresponding effect on the electroencephalogram. Borderline cases occur, however, in which the electroencephalogram is either normal or dysrhythmic with a build-up on hyperventilation, with a background of emotional instability or hysteria and with the precipitation of atypical spells under circumstances of emotional stress with hyperventilation. These cases cannot, in our opinion, be diagnosed as epilepsy, but the high incidence of cerebral dysrhythmia indicates that a physiologic disorder exists concurrently with the personality disorder. Perhaps the dysrhythmia conditions the neurotic manifestation to the convulsive pattern.

The importance of determining the relationship of hyperventilation to the occurrence of spells is emphasized by the cases studied. Close clinical observation of the patient during hyperventilation under standard conditions at the time of electroencephalographic recording could be valuable in distinguishing the border line cases. It is suggested that a report of the clinical reaction of the patient during hyperventilation as well as the report of the electroencephalogram response during hyperventilation, be made routinely.

Summary

Thirty-six patients who presented on original examination the problem of the differential diagnosis of epilepsy and hysteria were seen for follow-up examination one to three years later.

Nineteen patients had definitely abnormal electroencephalograms, eight showed minor irregularities and nine were normal. (a) Of the 19 patients with abnormal electroencephalograms 11 were considered to have epilepsy alone, three to have both epilepsy and hysteria, and five were not considered to have epilepsy. (b) Of the 17 patients having normal electroencephalograms or showing only minor electroencephalographic irregularities, four were considered to have epilepsy and 13 not to have epilepsy.

A clear description of a typical convulsive attack or the observation thereof was considered good evidence for epilepsy.

An indifferent response to anticonvulsive medication, with cessation of the spells following psychotherapy after medication was discontinued, was considered good evidence against epilepsy.

Non-epileptic patients displayed emotional instability or hysterical personalities and often had a history of hyperventilation preceding attacks.

The importance of the role of hyperventilation in the evaluation of borderline cases is emphasized. It is suggested that in these cases the cerebral dysrhythmia may condition the neurotic manifestation to the convulsive pattern.

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SAVE FOR YOUR INDEPENDENCE • BUY U.S. SAVINGS BONDS •

Treatment of Psychopathic Personality by Transorbital Leucotomy

JOSEPH F. WHALEN, M.D., HARRY F. DARLING, M.D.,
and JAMES W. SANDDAL, M.S.
Evanston, Wyoming

Many theories have been advanced to explain the psychopathic personality syndrome. One suggestion originally advanced by Cleckley, postulates that the disorder is a form of dementia or psychosis without manifestation of hallucinations, delusions, mood disturbances, or evidences of regression, found in the functional group of mental illnesses and commonly attributed to unknown or undetermined cause. It is, however, assumed that there is a covert psychosis manifested only by overt manifestations of asocial or amoral behavior or both, often occurring as periodic outbursts. Objection to leucotomy as a treatment for psychopathic personality has been made on the ground that these patients have a constitutional personality deficiency. Proponents of this older theory object to operation for the reason, it is asserted, that if one were performed it might remove entirely whatever inhibitions the afflicted individuals may have and make them even more difficult to manage. From a theoretical standpoint it may be argued that even if psychopathic personalities are deficient personalities, they nevertheless are personalities and the effect of leucotomy is to flatten out the personality and reduce drive.

The authors believe that psychopathic personality, although not manifested by overt personality disjunction in the usual verbalized manner, is a covert personality disorder manifested overtly by the behavior of the affected individual in his relation to other individuals, and demonstrable by objective psychological tests. The personalities and case histories follow definite, stereotyped patterns of symptomatology, which are so marked and definable that earlier psychiatric theorists philosophically attributed them to "moral" or "character" deficiency. That psychopathic personalities are malfunctions rather than defects of personality is easily demonstrable by the symptoms. Some cases develop in early childhood, others during puberty, and a few following puberty; a congenital defect of personality cannot logically become manifest at the age of six in one individual and at the age of sixteen in another. The illness is progressive; although many cases have their onset in early childhood, most cases are not marked social problems until they reach their teens and sometimes later. Certain cases recover spontaneously during or after middle life; a congenital lack could no more become remedied at this age than could an intellectual deficiency. That these individuals are frankly mentally ill is evident by their behavior alone; it is more bizarre and purposeless than neurotic behavior and more bizarre than that of many frank psychotics; it is not amenable to treatment; it is not based on normal drives or reasoning and in fact it is often beyond the control of the affected individual. These individuals suffer from an illness rather than a lack, and their illness is chronic and severe. Merely because the illness is not verbalized is no reason to deny its existence, or to attribute it to some indefinable and inexplicable defect in personality, or to a congenital lack of inhibitions.

After long study and examination of the various theories explaining the basis of the disorder we concluded that the later concepts were more logical. The fears that leucotomy might remove latent inhibitions, seem to us to be ill founded. It was decided that the more modern theory would be a good theoretical basis upon which to perform transorbital leucotomies in psychopathic personalities should the opportunity present itself. The first case (below) was accordingly operated on June 26, 1950. It was felt that in the case of this individual,

From Wyoming State Hospital.

even if the older theory of psychopathic personality was valid, very little would be lost as this patient did not seem to have any inhibitions whatsoever. Having obtained good results upon this case, it was then decided to do five more troublesome cases which presented difficult problems in this small hospital due to their asocial, homicidal, and assaultive tendencies and the difficulty of keeping them confined. The operations on the rest of the cases summarized below were performed on March 21, 1951.

Four additional leucotomies were done later. All of these patients showed personality change but none seem to have lost inherent inhibitions. These cases have not been observed for a sufficiently long time to report in this article but they are mentioned to disprove the theoretical premise that leucotomy is contraindicated in psychopathic personality because it might make the patient worse.

Diagnostic psychological tests were used as a check on observation and also to determine any change in general intelligence. The tests used were the Wechsler-Bellevue Intelligence Scale, Form One, to check on intelligence and personality changes, if any, the Otis Self Administering Test of Mental Ability, Higher Examination, Form B, and the Minnesota Multiphasic Personality Inventory. It is realized that the tests do not cover as comprehensive a study as might be deemed necessary to give a complete picture of the subject. However, it may be pointed out that the patients were confined in this institution following leucotomy and every opportunity was present to talk with and observe each subject so that comprehensive testing was not necessary.

The Freeman-Watts technique was used in all the operations. A 4 cm. medial incision was made and a 7 cm. cut through an arc of 15 to 20 degrees was made bilaterally. No deep frontal cut was done in any of these cases.

Case Histories

Case One: As long as this patient's mother can remember, he had always been a problem child. He was always fighting with other children in school. When he was in the seventh grade, he began to have trouble with his teachers. At the age of eleven he ran away from home; no amount of talking or punishment would stop him from running away. He was absent from school without permission many times. At the age of twelve he was found prowling around town and jailed. He was then transferred to the county home but ran away from there. He was committed to the State Industrial Institute at Worland, Wyoming, where he remained for eighteen months being discharged at the age of fourteen. During the first week he was home, he tried to make love to his sister and a week later to his twenty-three year old aunt. He had five different jobs in one month. He tried to put his arms around a neighbor lady who happened to have a knife in her hand. She threatened to use the knife on him and he responded that he could take the knife away from her, and did so. He stole a bicycle and started for Denver, one hundred miles away. There is a long history of petty larceny. In his eleventh year, patient threw some live coals into the coal pile. He burned lighter fluid outside his bedroom window and the neighbors called the fire department. An encephalogram taken at the Colorado State Hospital September 2, 1947 was negative. At sixteen he was committed to the Wyoming State Hospital because of repeated attacks on his mother and sister. He was found to be a well nourished and developed male in good physical condition with negative neurological and laboratory findings. From the time of admission patient had to be under constant supervision to prevent his escape. There were some sexual deviations, especially toward another male patient in the hospital. These patients had been confined together at the State Industrial Institute where it had been necessary to segregate them. He did not get along with other patients and scarcely a week passed that he did not have a fight.

Intelligence testing of this subject showed him to be of low normal general mental ability. Minnesota Multiphasic Personality Inventory scores prior to the operation revealed a score of 77 in depression and 73 in psychopathic deviation on a minimum normal score of 70. Results on other tests are not available. One year following leucotomy, intelligence tests resulted in relatively equal scores and scores on the Minnesota Multiphasic Personality Inventory were much improved. The depressive scale score was now 40 and the psychopathic deviate scale 60. Other scores were well within the normal.

Following operation, patient has been very tractable and has not fought with another individual for a whole year. After two months of satisfactory behavior it was deemed safe to put him to work on the hospital ranch. Four months later he was placed on a ranch outside the state. He worked there several weeks until the ranch changed hands and he returned to the hospital voluntarily because he had no other place to go. He was again placed on a ranch, worked a month, and then returned to the hospital voluntarily. He does not appear to have enough initiative to work away from the hospital. This patient is not improved sufficiently to adjust away from the hospital, but he is not now

a dangerous or homicidal patient who is a hospital problem. His institutional adjustment is excellent.

Case Two: From a rather early age this patient has had temper tantrums with unprovoked assaults upon others. Five years before he beat a boy with a club. At the age of fourteen he literally cut another boy's heart out with a knife following an argument at a football game. He was convicted of manslaughter and paroled to Boys' Town, Nebraska. He remained there six months, but left that institution on several occasions without permission. He accepted placement at Boys' Town as a personal affront and resented its rules. He managed to acquire guns at Boys' Town; on one occasion he got hold of a .22 caliber rifle and upon another he carried a pistol in his pocket, cocked and loaded. When a boy threw a pebble at him in the street patient fired the pistol at him but fortunately missed. He boasted to another boy that he was a badman and remarked to the boy and the authorities he was going to prove to them he was a badman. He tried to stab one boy and engaged in fisticuffs with many others. The authorities at Boys' Town were unable to control this patient and he was returned to Wyoming where he was placed in the State Industrial Institute. A few weeks later he was committed to the Wyoming State Hospital.

Patient was of average general mental ability with a T-score of 68 on the psychopathic scale of the Minnesota Multiphasic Personality Inventory previous to leucotomy. All of the scores were well within normal range. One month following leucotomy T-score on the psychopathic deviate scale was 71, and on the schizophrenia scale 71. All other scores were much higher than previous testing had shown, although they were again within normal range. The K-score had risen from 48 to 64. Three months after leucotomy the K-score was 72, but the psychopathic deviate score had fallen to 64, and the schizophrenic score had fallen to 69. Contrary to previous testing, the manic score had risen from 53 to 63.

Previous to leucotomy this patient was assaultive and combative with other patients and with attendants. He and two other subjects of this series while attempting to escape beat an attendant into insensibility. Immediately following leucotomy this patient was euphoric and a week or ten days later complained of insomnia. He became very restless and paced up and down the halls and porches on the ward. During six months he had only one assaultive outburst. Following the operation he engaged in homosexual activities with another patient and it was necessary to separate them. He worked on the hospital ranch for a few months until he was discovered concealing two heavy wrenches in his pocket and it was decided that because he had been such an extremely dangerous patient that his work be terminated. He has never attempted escape from the hospital since leucotomy. His adjustment is good on the maximum security ward in which he is placed. It was noted that transorbital leucotomy did not relieve all of this patient's tension. He evidenced constant fine tremors in his hands. Although he is markedly improved and is no longer considered extremely dangerous, it would be desirable in his case to decrease tension. In the future a second operation will be done on this patient using the deep frontal cut. It is interesting to note in this case that his home environment was so poor and his parents and grandparents of such a violent psychopathic and alcoholic nature that it is doubtful if much more improvement could be obtained. He has never seen a normal environment having lived on an isolated ranch prior to his homicide.

Case Three: This patient has a history of temper tantrums and sadistic tendencies from an early age having tormented animals for a number of years. He had a poorer school record than his intelligence would warrant, but he had a good work record. At nineteen, following the attempted rape of a four year old child, this patient was committed to the Wyoming State Hospital. Emotionally he had no remorse regarding the incident and laughed in an indifferent fashion and stated it was the usual thing in his community. He had broken into mail boxes several times in the last year. Prior to leucotomy he was sullen and indifferent. He was discovered several times abusing other patients in a sadistic manner but has never been combative. He attempted escape from the hospital twice and once succeeded.

Prior to leucotomy patient scored 86 on the full scale, Wechsler-Bellevue Intelligence Scale, 82 on the Otis Self Administering Test of mental ability, and a T-score of 75 on the depression scale, and 71 on the psychopathic scale of the Minnesota Multiphasic Personality Inventory. All other scores were well within normal range. Following leucotomy, the Wechsler-Bellevue Intelligence Scale full scale score had increased to 98 and the Otis Self Administering Test of Mental Ability score was 83. One month after leucotomy, the Minnesota Multiphasic Personality Inventory depression scale had dropped to 68 and the psychopathic csale to 63. Three months following leucotomy, depression scale had dropped to 56 and the psychopathic deviate scale remained at 64. All other scores on the Minnesota Multiphasic Personality Inventory were well within normal limits throughout the testing period.

Following operation, this patient's facial expression showed more mobility and relaxation than formerly. He appeared more alert and interested in his surroundings. Following an initial two weeks of euphoric and hyperactive behavior, patient appeared to be happy and relaxed, and was not at all sullen. Almost immediately he was transferred from the maximum security ward to another ward where he did very well for a period of ten weeks, and was of much assistance on the ward helping with the older patients, where previously he had been sadistically inclined toward such patients. Improvement was so marked that he was sent home from the hospital four months ago and since that time he has been well adjusted and without any of

his previous psychopathic tendencies to larceny, temper tantrums, and aberrant sexual behavior.

Case Four: This patient, age 18, was admitted to the Wyoming State Hospital for thirty days' observation in connection with a charge of arson. Family history in this case was poor. The paternal grandfather was a psychopath and his father was suicidal. He has been shop lifting since the age of seven. At sixteen he stole a car "for a thrill" and abandoned it nearby. This was only admitted under narcodiagnosis as patient was not apprehended. He has been truant at school ever since he started school. At eleven he was sent to Boys' Town, Nebraska, adjusted well and was released. He has set admit he even touched liquor. Under narcodiagnosis admitted drinking but will not in a conscious state admit he was even drunk. Under narcodiagnosis he denies any motive for setting fires; no symptoms of psychosis or neurosis were noted. Under narcodiagnosis he states that he likes to humiliate his friends. He has never used a dangerous weapon but states that he would not hesitate to do so to humiliate people but not to kill. There appears to be no sexual deviation. Patient states that his motive for stealing is to gain money, and by having money he could have nice things and a certain amount of power. He infers that he has not had as many advantages as his friends but it is noted that patient is very well dressed and has plenty of spending money at this hospital. He has no remorse for past deeds and does not feel he should be punished, although he realizes he was legally wrong and knew the consequences. He insists it is right to obtain money in any way possible. He did not appear disturbed when he learned that the arson had caused tens of thousands dollars damage. He has been mildly irritable at the hospital. He has no somatic complaints, paranoid delusions or hallucinations, or ideas of reference. It would appear that much of his aggressive behavior is a means to insult and humiliate people rather than hurt them. It is especially notable that he wishes to humiliate friends, not strangers. His work in school had been excellent.

This patient had a high general mental ability obtaining a score of 120 on the Otis Self Administering Test of mental ability previous to leucotomy. Before leucotomy patient made high scores on the schizophrenic scale of 71, manic scale of 70, and the psychopathic deviate scale of 67. However, a score of 70 was obtained on the full scale indicating that the validity of the test was impaired. Examination and study of the patient indicated that he perhaps made his score on the schizophrenic and manic scales spuriously high as an attempt to escape the consequences of his crime. One month following leucotomy the Otis I.Q. score had dropped to 116 and the Minnesota Multiphasic Personality Inventory score had dropped to 60 for the psychopathic deviate, 58 for schizophrenia, and 48 for manic. At the same time the full scale had dropped from 70 to 50 and the K-score had raised from 42 to 67. Three months after leucotomy psychopathic deviate score was 60 and all other scores were well below. The full scale was down to 47 and the K-score remained at 67. These tests scores and conclusions from clinical observations indicate that subject is a true psychopath rather than a personality indicated in first testing. This confirms the results obtained by narcodiagnosis.

This patient is a more intellectual type of psychopath than the others in the series and smart enough not to indulge in directly assaultive behavior while in confinement. It was noticed after leucotomy, however, that he did not seem to be so irritable with other patients, nor did it disturb him to answer questions. He was sincerely cooperative. Although it is a hospital rule that no patients are allowed to have matches, in some way this patient obtained a box of matches which he carried about his person for a month before he was discovered. He did not attempt to set any fires and it is believed that his explanation that he wanted the matches only to light his cigarettes was valid as he is a heavy smoker, and smoking is permitted only at certain times in the hospital. It is difficult to ascertain accurately how much improvement has been obtained in this patient and possibly a year or more follow-up will be necessary. Three months after leucotomy he was returned to the authorities in his home county where he is now awaiting trial for arson.

Case Five: This patient's earliest delinquency was petty larceny at the age of eleven. Truancy was frequent, and by thirteen patient was convicted of grand larceny. He stole a surveyor's telescope from a government car. He was committed to the Wyoming State Industrial Institute. He was found to be a sexual deviate, indulging actively and passively in anal coitus. He denies any other perversions. He was subsequently released, and at the age of fifteen violated parole by stealing a truck. While in the county jail, he and another boy maliciously damaged the plumbing and also prepared a blackjack to be used on one of the guards en route to the Industrial School. He was committed to the Wyoming State Hospital at sixteen. He stated everyone picked on him at the Industrial School and said he wished to do the sheriff in his home county bodily harm, and later threatened to kill him. He had tried to kill him previously. This patient was the ring leader of a group of four delinquent youths who had been committed to this hospital, all of whom were on the maximum security ward. He threatened to kill attendants several times. He tried to lead an organized break out of the maximum security ward several times; on the second occasion he nearly killed an attendant. He bragged about his larceny and attempted homicides. He is ordinarily a sullen and irritable individual. Although small, he is very wiry and his reflexes and activity are especially fast, and for this reason he was a very dangerous patient.

Previous to leucotomy patient scored an I.Q. of 91 on the full scale division of the Wechsler-Bellevue Intelligence Scale; verbal scale score was 85 and

performance scale score was 99. He scored an I. Q. of 75 on the Otis test. On the Minnesota Multiphasic Personality Inventory he obtained a T-score of 97 on the psychopathic deviate scale; 79 on the manic scale; 76 on the schizophrenic scale; and 78 on the hysteria scale. Validating scores were within normal range. One month following leucotomy the psychopathic deviate score had dropped to 69 but the paranoid scale had risen from 55 to 70. The schizophrenic scale remained at 76 and the manic scale at 70. Two months following leucotomy the Wechsler-Bellevue Intelligence Scale was again administered. This time he obtained verbal scale I.Q. of 90, performance scale I.Q. of 98, and the full scale score of 93. At this time he denied remembering having taken this test. The new Otis score was 89. Three months following leucotomy psychopathic deviate scale showed a T-score of 76 and a schizophrenic score of 68. All other scales had dropped to below 60.

Following transorbital leucotomy this patient's tenseness was much relieved. Where formerly he had a fine tremor in his hand, his fingers are now steady. He stated very emphatically he did not feel like killing anyone. After an initial ten days period of marked euphoria, the patient's mood settled down to the point where he was rather happy-go-lucky and cheerful in contradistinction to his former sullenness and resistiveness. After three months without threats or attempts, during which period patient was steadily employed in the cafeteria, and during which time patient had adjusted on another ward than the maximum security ward, patient was given into the custody of his mother and went to California. Two months later, with another boy, patient stole a car, but in contradistinction to his former behavior he was not hostile to the authorities and decided that he should take his punishment. He will probably be sent to an industrial school in California. Improvement of this patient's psychopathic personality was only to the extent of removing homicidal tendencies, but his larcenous tendencies are not improved. However, instead of being dangerous, this patient is now only a nuisance to society. It is possible that he may be retrained in an industrial school for he is now only seventeen years of age.

Case Six: This patient was committed to the Wyoming State Hospital at the age of sixteen for grand and petty larceny, homosexuality and bestiality. He first ran away when he was six years old and was persistent in this tendency, sometimes remaining overnight. At this age he also began to steal. Between the seventh and tenth year his thefts became so frequent that the local newspapers dubbed him the "phantom." At the age of ten he was apprehended and given into the custody of his father. Four months later he stole a bicycle, and was again paroled to his father. At the age of twelve he broke into an apartment and stole various goods and money and was then sent to the Wyoming State Industrial Institute for an indefinite sentence. In his thirteenth year, after a year at the Industrial Institute, he indulged in homosexual relations from that time until his commitment to the Wyoming State Hospital. At the age of fourteen he was released from the Industrial Institute and worked as a newspaper boy. After wrecking the company's printing press he was returned to the Industrial Institute. He was again placed on parole and sent to St. Francis Boys' Home in Kansas as the result of the intercession of a minister, but they soon returned him and he was committed to the Wyoming State hospital. He had electric shock while at this institution and was then sent to a psychiatric clinic in Kansas. In his two years stay at the Wyoming State Hospital no symptoms of psychosis were demonstrated although he was very sadistic with an abnormal interest in the death of animals.

This patient was eighteen years old when leucotomy was performed. He had a verbal scale I.Q. of 86, performance scale I.Q. of 108, and full scale I.Q. of 96 on the Wechsler-Bellevue Intelligence Scale before leucotomy, and I.Q. score of 91 on the Otis Test. Minnesota Multiphasic Personality Inventory showed him to be high on the schizophrenia scale (T-score 71) and only a score of 64 on the psychopathic deviate scale. Because of his behavior, which was substantiated by an analysis of part scores on the Wechsler-Bellevue Intelligence Scale, it was felt that patient was a psychopathic deviate rather than a schizophrenic. One month following leucotomy, patient scored 76 on the psychopathic deviate scale and 69 on the schizophrenic scale. Two months later, when it was realized patient's behavior was becoming worse, patient obtained T-score of 73 for schizophrenia, 70 for manic, 69 on the psychopathic deviate scale, and 70 for depression. Validating scores were normal although the F-score stood at 64.

Transorbital leucotomy was performed after the patient had been at the hospital for three years. During his stay he was a constant problem. He was not violent but was a homosexual and a pathological liar. He instigated trouble, usually among other juveniles, and escaped several times, always in the company of a more aggressive psychopath. He showed a marked improvement following leucotomy and his personality was definitely changed. This improvement only persisted three months, however. The patient's personality changed back to what it had been before operation and the patient has escaped from the hospital once in the six months following operation. He has also indulged in homosexual behavior with other psychopaths from whom he had to be segregated. He is again a trouble maker, instigating other psychopaths to carry out his plots. Deep frontal cut is being planned for a second operation on this patient who is the only patient of the six who showed no permanent improvement of any type whatsoever.

Conclusions:

1. Of six criminal psychopaths upon whom transorbital leucotomy was performed, five

showed clinical improvement over a period of six months or more. The sixth case showed a personality change extending over a three month period, then regressed.

2. Previous to leucotomy, maximum security was mandatory in all six cases. Six months after operation, maximum security was only necessary in two cases. One of these is now tractable in maximum security and is a ward helper. A deep frontal cut is probably indicated in both these cases and a second operation is contemplated, in the one case because there was no permanent improvement, and in the other because he shows much nervous tension.

3. Three cases were constantly homicidally agressive. Two of these lost their assaultive tendencies during six months following operation and the third over the period of a year.

4. Four cases left the hospital. One has remained well adjusted. One committed grand larceny, but was not destructive or homicidally assaultive as previously. One was placed in ranch employment several times but could not hold a job over an extended period. One is on trial for arson, and a longer follow-up will be necessary in his case; his tendencies to arson have apparently been relieved and it is doubtful that, if sentenced, he will become a "repeater" of this felony.

5. The Minnesota Multiphasic Personality Inventory is a sensitive, objective, and reliable tool in diagnosis and in evaluating results. The four cases who adjusted off the maximum security ward showed a marked reduction in the psychopathic deviate scale three months following the operation as compared with results previous to the operation. Three of them attained scores well within the normal range as designated in the test and the fourth was near the cutting limits. The case who did not show any permanent personality change showed a slight increase in this scale, and is still on the maximum security ward. The other case who is still on this ward showed no change in this scale, but is clinically improved, mainly because he has not been assaultive; he shows much nervous tension; other scales showed improvement. Other deviations disclosed by the test normalized in all patients in which they occurred.

6. No significant change was noted in both of two intelligence tests given before and after operation.

7. The six operated cases showed no removal of inhibitions. Four cases subsequently operated have shown no such change as yet. It is extremely doubtful that transorbital leucotomy will remove the inhibitions of psychopaths, as has been theoretically postulated.

8. The results seem to corroborate the theory that psychopathic personalities are individuals who are covertly psychotic, and who manifest their derangements overtly by behavior disorder. The results seem to contradict the older theories that psychopathic personality is a deficiency—that something in the personality is lacking. It seems that the syndrome is an abnormality rather than a defect in personality development. Psychopaths are probably the sickest of the mentally ill.

9. If the worst type of criminal psychopath has been improved, even better results should be expected in milder cases in their adjustment in society. Adjustment in these criminal cases is satisfactory because a major hospital administration problem has been removed. It is felt that the results obtained justify the operative risk.

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Hypnotic Investigation and Relief of Recurrent Anxiety Episodes

JEROME M. SCHNECK, M.D.
New York, New York

The case reported in this paper constitutes one example of a type suitable for hypnotherapy. It falls into the category of a relatively circumscribed problem, the dynamics of which may be inferred at least in part from data made available prior to hypnotic therapy. Such case material even when somewhat less circumscribed and with less clear-cut psychodynamics continues to warrant a hypnotherapeutic approach. This does not imply that other methods of treatment are contraindicated. A fairly direct insight approach and clarification along with symptom relief would appear to be facilitated with hypnotic techniques. The decision to employ hypnosis is, however, not enough. A knowledge of psychodynamics, an awareness of the role of anxiety and resistance in treatment, an ability to evaluate current needs of the patient, an awareness of transference relationships and knowledge of when to make interpretations and when to avoid them, are among many other principles of psychotherapy, essential for good treatment. In addition, however, aptitude with a variety of hypnotic methods and a feeling of security through use gained from experience, is a prerequisite for expeditious handling of such patients.

The patient to be presented will be discussed from the view of an evaluation of preliminary historical data, induction procedure, techniques employed, management of anxiety and resistance, determination of goals, limitations in treatment, some aspects of psychodynamics, and participation of the patient in the extent to which the therapeutic process was to be carried.

Background Data:

Patient was a 32 year old mother of three children. Fourteen months prior to treatment she experienced a severe anxiety attack during the night when she arose to feed her youngest child. A history of temporally related events revealed that shortly before this she had learned about the death of a 75 year old woman whom she had begun to regard rather affectionately. Her feeling of anxiety followed the usual pattern and included tachycardia as well as intense fear of immediate, sudden death. Because of this, the family physician was consulted. A series of similar episodes followed this first attack. An undercurrent of anxiety then set in and persisted between acute episodes. Increasingly she developed an interest in investigating and eliminating her symptoms.

Questions asked of the patient permitted her to reveal that she considered her mother rigid and domineering. Contact between them had been severed after the mother had disapproved of the patient's marriage. Contact had been reestablished about two months after the first anxiety episode. It was surmised tentatively that the episodes of anxiety may have been connected with the patient's relationship with her mother, with the conjecture that the woman who died may have represented a good mother figure to her. In addition it was felt that feelings of hostility toward her children may have been significant owing to the burden in caring for their basic everyday requirements and the restrictions imposed upon her personal activities and pleasures. A concentration of these psychological stresses at one particular time may very well have set off the marked anxiety in a predisposed, rigid person with hysterical reaction patterns.

Further exploration revealed that in the past the patient had had a cancer phobia. When asked whether any one in her family had suffered a heart difficulty, she denied it at first, then reconsidered, and finally revealed that her mother had had a "rheumatic heart" for the past ten years. It was felt that the nature of her mother's disability

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From the Westchester County Mental Hygiene Clinics, New York.
Read before The Society for Clinical and Experimental Hypnosis, January, 1952.

was consistent with the suspected identification.

Although apparently withdrawn and inhibited during the first interview, the patient was able to show more spontaneity later in the course of this contact, with appropriate affect, a show of interest, and participation in a discussion of treatment techniques. During this exchange, the use of hypnotherapy was suggested after she had mentioned hearing about its employment.

Hypnotic Induction and First Session:

In this session, after a brief exchange about her symptoms, hypnosis was induced for the first time. She had mentioned feeling a little tense in anticipation. A visual fixation technique was employed. The trance was achieved smoothly and fairly rapidly. When an attempt was made to have the patient re-experience a pleasurable episode of her past life—any of her own choosing—she was, interestingly, unable to achieve this. (This furnishes one example of many available in relation to initial hypnotic procedures which assist in evaluation of a patient's personality and developmental problems.) She was, however, able to re-live an ordinary scene from the context of her everyday life. (Mobilization of forces of repression were unnecessary in this instance since the material was not highly affectively charged.) Hypnotic dreaming was explained to the patient and she was told she would have such a dream. She indicated having achieved this but was not questioned about it at the time in order to avoid the impression that there would be pressure placed on her to reveal more than she might wish.

The patient was then given post-hypnotic suggestions to the effect that between weekly visits there would occur within her own unconscious a gradual piecing together of ideas and feelings so that a pattern would be formed. Eventually, in the near future, this pattern would be brought to conscious awareness so that we would be able to understand her difficulties and work toward their solution. These instructions were offered to the patient in order to have her sense her own cooperation in treatment, to indicate that she would not be hurried, and to encourage therapeutic work during intervals between visits so as to cut down total treatment time. The patient was asked to affirm her understanding of these instructions, which she did. Then she was given post-hypnotic suggestions for entering hypnosis subsequently on a one to ten count or any other prearranged signal, and to go into a deeper hypnosis each time. This was done to facilitate and speed up the hypnotic induction, again in order to save time. Further instructions were to the effect that she would achieve partial or complete post hypnotic amnesias when we considered this desirable. She expressed a wish to recall this session when the choice was offered her and the hypnosis was then deepened, post-hypnotic suggestions for feelings of well being on termination of the hypnosis were offered, and the patient was brought out of the hypnotic state on a one to five count. She expressed an interest in the manner in which she responded to the hypnotic procedure and her positive approach to this was regarded as a favorable sign in terms of over-all cooperation.

Second Session:

During this visit the patient told of a dream in which she had an operation on her spine. (She did, in fact, have a slight curvature, which perhaps accounted for this specific somatic focus as well as possible symbolic implications of "spine" in relation to personality.) She was concerned and fearful in the dream. It was inferred that the operation symbolized her psychotherapy; consequently her anxiety was felt to indicate a guarded approach as far as dealing with conflict material was concerned. No comments were made to her about the dream but it was used as a starting point for additional questioning about dreams and she revealed that a few weeks previously, after a reconciliation with her mother, she dreamed her mother had died. The dream troubled her, especially during a subsequent visit of her mother. No interpretations were offered.

A hypnotic state was induced and the patient was told that she was going to have an hypnotic dream which would furnish a clue as to what was involved in her anxiety episodes. She would either be unaware at this time of the implications or meaning of the

dream or else she would be dimly aware, although not understanding completely. This technique was used in an attempt to control the rate of insight and the degree of anxiety she might experience as well as to clarify for the therapist himself the track along which treatment would be moving. There was a long delay and finally the patient indicated that the instructions were not clear. It seemed that the delay was an indication of resistance since further explanation could have been sought immediately. The instructions were repeated and soon the patient signalled the beginning and end of the dream by raising her hand as had been requested. "I saw a woman. She was calling me." (Dr.: Who is the woman?) "My mother." No comment was made. Instead, she was told she would have another hypnotic dream and that it would concern something that was troubling her, although she may not understand clearly just what this was. The patient dreamed, "I saw a coffin with a dead person in it." (Dr.: Who is the person?) "I don't know." (Dr.: What was your feeling in the dream?) "Just looking." (Dr.: Any feeling?) "Frightened maybe." (Dr.: Any thoughts about the first dream?) "No." Similar post-hypnotic suggestions as had previously been given were now repeated. She was told she would feel that a long time was passing. Then, after a few moments the hypnosis was terminated. The suggestions regarding time were offered in order to affect time perception in hypnosis so as to facilitate a "settling" of the material dealt with during the session.

Third Session:

The patient said she had been thinking about the hypnotic dreams and did not seem to be able to forget them. They had unpleasant associations, she added, but she seemed reluctant to explain. Encouraged further, she referred to the dream about the coffin and about the person in it. "It was a man," she claimed, commenting that she had forgotten to mention this. This note about the sex of the person was deemed likely to be an unconscious reversal of the actual sex in an attempt to reenforce the repression; the point involved was that it appeared very likely that again, the person involved was her mother (based on preceding data), but nothing was said to the patient.

Encouraged further, she revealed that when she was three or four years old there was a phonograph at home. Her mother had told her not to touch the needles, because of the danger that the patient might swallow them or otherwise hurt herself. The patient said her mother had threatened that if she touched them she would die. One day she ventured to do so and promptly fainted. She was revived by her mother. The patient maintained further that at five or six she was being punished for something and her mother had occasion to remark, "Some day you're to die." When she became distressed her mother attempted to reassure her and even ventured later to tell her that she (the patient), as a matter of fact, would not die. But the patient was not reassured. These recollections were accepted as the patient revealed them and an attempt was made at the time to distinguish between actual and screen memories. In either case the material was intrinsically of importance. Then the patient commented again about her morbid fear of death and it was discussed in relation to her first anxiety attack. It was pointed out that the idea of fearing death appeared to be linked with the idea of doing wrong or being bad. These were tied in with the idea of punishment and the entire constellation appeared integrated with the idea of actual death itself. She claimed this had meaning for her. Despite this, she felt that although wrong-doing seemed linked with her first anxiety episode, no further thoughts were forthcoming.

Another hypnotic state was induced and instructions given that partial or complete amnesia for the material of the session could be utilized if we decided to do so. She indicated her understanding. While she was in hypnosis the facts were reviewed that fear of death appeared to be linked with her anxiety episodes and that concern about death dated to her early childhood. Further, there was linked with this the idea of punishment for wrong-doing and this was tied in with her feeling or thinking in some particular way which was associated with her idea of being bad. Following this she was asked to focus on the first anxiety attack and

she was told she would have a hypnotic dream. The dream would indicate what was present deeply within her mind at the time of the episode. She would feel this deeply or else the dream would furnish data supplying a clue as to what was in her mind at that time. Her response was, "I only see a very tiny baby. Just an infant." The patient was then told that she would have another hypnotic dream which would explain the meaning of the first. "I feel mad at the baby. I feel I want to *kill* it." (The patient's head started to shake when she began to relate the dream.)

The patient was given time to think about this material. Then she was instructed to have another hypnotic dream which would explain why she wanted to kill the infant. Her head started to shake. "This isn't too clear to me. I just think that I see a bed and that's all. I'm not so sure." (Dr.: Yes?) "I don't know. Maybe I'd rather sleep than get up nights for the baby." She was not pressed further along these lines because it was believed that at this time she would not be able to cope with the anxiety that might arise.

The patient was told that we would investigate her mental imagery in relation to certain feelings that she experienced. One of these was the feeling of hostility. Her image was, "I see my mother with a big strap in her hand. She is beating me." The patient's head started to shake back and forth again. (Dr.: Any thoughts occurring to you?) "Yes." (Dr.: What?) "The feeling that my mother gave me about being with boys. She didn't want me to play with them when I was a girl. She didn't want me to date them when I grew up. She said it was a sin to be with them." Then she began to cry aloud with profuse tears and manifestation of great distress. Some time was allowed to elapse and then she was addressed again, but the patient was reluctant to continue and indicated she did not feel well. She revealed she could not talk further and was able to say she experienced a "sense of guilt," feeling "I had done something wrong." She did not want to discuss what she was thinking about. When asked whether she wished to remember or forget the details of the hypnosis she chose the latter. (Her desire in this regard was sought for several reasons and such situations occur often. Asking this of the patient helps give her the feeling that her emotional needs are taken into consideration. She is given an opportunity to make an active choice. A good transference relationship is cemented.) When the post-hypnotic instructions for the development of a complete amnesia were given, they were worded so as to indicate to the patient that the events of the session would slip away from her only if she really chose to have this happen. Prior to emerging from the hypnosis she would think about it carefully. (Such wording of suggestions is arranged when the therapist believes that although the immediate, acute anxiety is painful, the patient actually can manage to tolerate this anxiety when given time. Thus, if the need to repress is not urgent, the amnesia might be partial or absent. Otherwise, if the amnesia is forced, the tendency on the part of the patient to utilize the mechanism of repression would be reenforced undesirably. At times this tendency may be used temporarily for therapeutic leverage but this would not apply in the current situation. A safeguard employed here was to instruct the patient that any material forgotten would arise at a later date whenever we wished to deal with it.) After all suggestions and instructions had been carefully given the hypnotic state was terminated. She commented that she recalled the events of the session, seemed somewhat withdrawn and preoccupied, and asked a few questions about the likely length of treatment and whether hypnosis would be used throughout. It was felt that these questions signified growing resistances, although further evaluation would have to wait, but it introduced also the question as to whether a more decisive attempt at complete post-hypnotic amnesia should have been made. About this there probably would be a difference of opinion.

Fourth Session:

At her next visit, the patient said she had been thinking so much about the material which had arisen that she had actually developed headaches, something not characteristic of her. When she set the material aside, the headaches disappeared, so the relation-

ship between the two was evident to her. When asked whether she would mention now the things she had not wished to verbalize last time, she said that she had re-lived very intensely during the hypnotic session the beating scene when her mother hit her, and all her past feelings and attitudes were re-experienced. Her emotional response had been complete. She then told of how very demanding her mother was of her when the patient was a young child. She was made to wash dishes and floors and claimed she was not permitted to go out and enjoy herself very much. She recalled being prevented once from playing with a doll. Her mother was very "finicky" and so on. Once when a neighbor boy broke her doll she was punished by her mother. At the present time such attitudes by her mother no longer existed, she said. She asserted, "I loved her through fear." "I was scared of her." She revealed all of this with much emotion and was permitted to continue. She told of another beating as a result of wearing a multicolored dress in the rain contrary to instructions. Then she said she could not understand why her mother "seems to come into the picture so much." No interpretations were offered. "I left home when I got married, and I got married so that I would be able to leave home." "Then I got children one after the other—three in five years." Asked how she felt, she said that before they were born she didn't want any but now that she had them she loved them. She added, however, that they were actually a hindrance to her going out and so she had never really had any good times. She was told that she tends to feel things deeply and intensely and that she develops considerable feelings of guilt. She confirmed both these points.

The patient then went on to speak about her feelings of inferiority, relating this at least in part to the fact that at home her parents used a foreign language, and when she started school she could hardly speak English. She had been uncomfortable about the limited education of her parents and for a time had felt that she herself was lacking. She claimed that more recently her self-evaluation in this respect had changed.

The patient then embarked on a description of some difficulties with a sister-in-law and she was given the opportunity to relieve tension through this emotional discharge, preparatory to further work along more crucial channels. It was felt that she would work more effectively if over-all tension were reduced. Toward the end of the session a hypnotic state was induced and the patient was informed that certain important points would be stressed. She would realize their importance even more in the near future as she worked on them. She was told that two types of feeling were extremely important to her. One involved feelings of affection and love. The other involved feelings of dislike and hate. She, as well as other people, tend to do a good deal of thinking about this, and mental images are developed. The latter clearly involve other people. It was indicated to the patient that actually this material is linked with the fact that she experiences deep feelings and tends to feel guilty, perhaps too guilty on occasions. (The involvement of the therapist with the patient's superego functioning was deliberate, in order to lend support, raise questions about her past functioning, encourage re-evaluation, permit identification with a more lenient authority—the therapist, in comparison with the predominant authoritative figure of the past—her mother, who had served as the basis of her early introjections and superego development, and in this way to help diminish the intensity of the repression.) The patient was told that everything just mentioned was associated with the following events: anxiety attacks; the woman who died; the patient's mother; the patient's entire past; the patient's children. All this material would gradually become integrated in her thinking and she was told she would work on it between visits as well as during her sessions. She was encouraged to work actively along these lines and that gradually she would arrive at a clearer understanding. She was given additional time in hypnosis, with no added comments, so that she might dwell on the data outlined. After the session was terminated the patient mentioned contemplating a visit to her mother in a few days, but her feelings about this were mixed. During the course of the conversation she was informed in a general way that she

really could feel free to make her own decisions without acceding to outside pressure, but no specific reference to her mother was offered.

Fifth Session:

At the beginning of the interview no attempt was made to use hypnosis because it was believed that this might constitute a threat. Instead she was permitted to deal with what she wished and she embarked on details of an argument with her sister-in-law. Again, tension release was permitted, although the data involved were not deemed to be directly related to the specific problem being explored. After twenty minutes, the patient said she had thought of the previous disucssion of liking and disliking, loving and hating, but had come up with nothing significant.

A hypnotic state was induced and the patient was told that we would deal with the above-mentioned issue. She was going to have a hypnotic dream which would deal with material from the past. It would also pertain to loving and hating a person. Although instructed about signalling the start and finish, her dream had begun before the instructions had been concluded. "I saw my mother. She was shouting at me." She couldn't see a connection between this and loving and hating. She was told she was going to integrate the idea of loving and hating, her past, and the dream about her mother. At this point she claimed she did not understand the instructions. Apparently her resistance had increased but nothing was said. The instructions were repeated. "I have so many thoughts I'm not sure of anything. Sometimes I loved her because she was my mother—it was natural to love a mother. Sometimes I think I hated her because she didn't let me do the things I wanted to do. Sometimes I thought she hated me—maybe because I was a girl. I don't know. Sometimes she would joke and tell me I wasn't her daughter. That they made a mistake at the hospital. That they gave her someone else's girl. Maybe I just imagined these things. I'm sure she loves me now." (Dr.: I want you to think back to the first time you had the anxiety attack. See what you can remember about it.) "All that I can remember is the day before this happened. . . . I was working hard at home all day. I was cleaning my living room . . . as a matter of fact, I was looking out the window to see if the people came to take the old lady who died that day but I didn't see them. . . . I thought about her, that's all. . . . Then I got that awful attack and thought I was dying. . . . I recall that I mentioned to my sister-in-law that I was going to see that lady the next day . . . but after the attack I wanted to forget everything. . . . I wanted to forget her and anything in connection with her."

The patient was given post-hypnotic suggestions to the effect that she would gradually begin to gather the implications of the very things she was saying. As she gained strength she would be able to tolerate the implications of all this material. She would continue to work unconsciously on these data between visits. The hypnosis was deepened and she was permitted to remain in it a little while, again to permit further assimilation of what had transpired. Then the hypnosis was terminated.

After coming out of the hypnosis the patient said that just before its termination (the time interval allowed before awakening) she was thinking about something which had much meaning for her. It "clicked." This was accompanied by a strong feeling of emotion. She was thinking about the old lady and the fact that this woman had died of a heart attack. Then she thought about her mother and the fact that her mother had "heart trouble." Then the two thoughts became linked, and fused in her mind. Immediately she thought about the fact that the first anxiety episode had set in when she was not on speaking terms with her mother. Next, she said she felt that if her mother had died at that time it would have had a catastrophic effect on her. She would have "gone to pieces." She repeated that this had considerable significance for her. Her eyes blurred and she said her heart was pounding.

Sixth Session:

The data from the preceding session were reviewed. She had become clearly aware of her identification of the old woman with

her mother and the displacement which had been effected, so that the relationship between the feeling of anxiety and involvement with her mother was evident to her. Feelings of guilt over the problem between herself and her mother could be clearly expressed. In discussing the material with the patient the most pronounced feature was her imparting the idea that if something had happened to her mother at that time, she would have developed a feeling of complete insecurity and helplessness.

During the hypnosis which followed the patient was told that she would now think about everything connected with what had been discussed, evolving a pattern of what had been involved in her anxiety episodes. She related that when she had not been speaking with her mother, the latter's influence had prevented contact with her father, brother, and sister. As a result, she felt that the only way contact could be reestablished with the others would be if someone were to die, because this would mean that a funeral would take place, and with the entire family present she would be with them again. It had occurred to her that her mother might die and in this way contact with the other relatives would be reestablished. Her mother's death would thus fulfill her other desire. The patient grasped the significance of this material and was it reviewed with her while she was still in hypnosis.

Following this, the matter of her intense feelings of infantile insecurity came up and she began to weep, stating that she had never realized the extent of these feelings. She commented that her husband had said she was not "grown up" yet. A discussion followed regarding the extent to which treatment might be continued in order to produce more extensive favorable personality changes. Since there was some question in the mind of the therapist regarding the patient's readiness for this, post-hypnotic suggestions were given to the effect that the patient would carefully consider the issue of embarking on further investigations.

Seventh Session:

At this time the patient revealed certain reactions occurring not infrequently in many types of treatment approaches. She told of having been depressed on two occasions and wondering whether she might develop difficulty in another area, as for example a cerebral hemorrhage. She was aware of the unrealistic nature of her thinking and said she felt embarrassed mentioning it. It was suggested to her that perhaps this reaction was based on misgivings regarding possible termination of treatment and that she feared a feeling of being deserted if this were to happen. This interpretation was clearly linked with a basic problem demonstrated by the data elicited in treatment. At this point she blushed, expressed embarrassment, and said that these very thoughts had occurred to her when evaluating her complaints. The reactions were discussed from the point of view of types of personality functioning characteristic of her.

The patient had not reached a decision regarding further explorations in treatment. She had been seen on a once a week basis and her contact with the mental hygiene clinic would have precluded more frequent visits. Exploration on a more extensive level would of necessity require continuation of treatment over a long period and this had to be evaluated from the view of clinic needs, facilities, and service to additional applicants. Taking into consideration all of these issues it was deemed desirable to permit the patient a longer period for further evaluation of her own needs, progress, and overall personality functioning following the work already done. A check-up interview was arranged for the near future.

Eighth and Ninth Sessions:

These sessions served as check-up contacts and took place one and three months respectively, following the seventh interview. The patient continued to get along well, had no complaints and was pleased with her progress following the therapeutic experience.

Now, with the passage of the first year following treatment, the patient has maintained her gains.

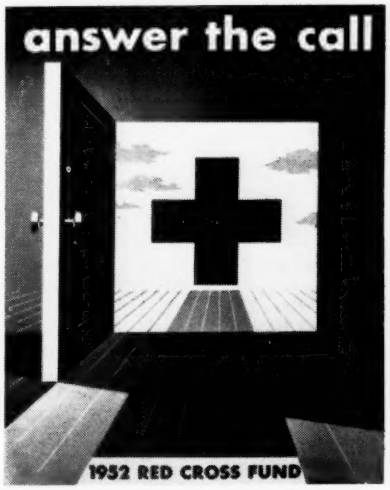
Discussion

An issue for consideration in this case is whether the evaluation of probable psycho-

dynamics based on the study contacts indicated likely success in treatment. The answer, perhaps, is not as simple as it may seem. Early clarification of the dynamics is of assistance to the therapist in prompting methods of approach in aiding the patient to arrive at certain insights. He may be blocked in these attempts, or problems may ensue if original conjectures were incorrect, or if apparently obvious facts proved to be misleading. Then again, theoretical concepts meaningful to the therapist may mean nothing to the patient in terms of setting the stage for emotionally significant therapeutic experiences. In this instance, however, the continuum from preliminary evaluation, therapeutic technique, insight, and change, operated effectively.

It is obvious, too, that therapeutic technique which cannot capitalize on preliminary evaluation will also result in failure. The techniques employed may, of course, vary considerably, and based on this, length of time in treatment with accomplishment of the same results will vary also. In the case described here, the hypnotherapeutic approach was illustrated, but other therapists may well utilize different specific methods within the framework of an hypnotic setting. That the hypnotic method favored directness and speed in this instance is an opinion favored by this writer.

In the reconstruction of dynamics there may be varying opinions regarding points of emphasis including, among others, hostility toward her children, hostility and death wishes toward her mother, and the dread of an emotional experience of complete infantile helplessness and insecurity. With mounting tension as her poor relationship with her mother continued, the stage was set by the death of the old woman who had been identified with her mother. Feelings of resentment toward her children because of their role in limiting her activities (a reactivation if not continuation of her hated childhood status), and the specific, momentary upsurge of hostility when her youngest child beckoned in the midst of this tension, pulled the trigger for the explosive reaction. In evaluating her ambivalence toward her mother, the question arises as to whether the hostility and death wishes with ensuing guilt were of greater or lesser importance than the psychological threat of infantile insecurity and helplessness. The feelings of panic experienced by the patient tend to suggest that the latter played the dominant role. The therapeutic data in general would seem to support this view, although the importance of the death wishes and guilt cannot be minimized. If an attempt were made to clarify the latter further through continued exploration, another impression might be obtained, but issues regarding such points of emphasis continue to be a problem in psychodynamic theory. Therapeutic expediency in this particular situation would relegate the theoretical issues to a secondary position. Many other interesting elements which may be linked with symptom-formation can be viewed in the case history and, if need be, more involved discussion of all these data is possible.



Schizophrenia In the Period of Involution

GUSTAV BYCHOWSKI, M.D.
New York, N. Y.

The period of involution offers a particular interest to the psychiatric clinician. It allows us to study the bearing on psychopathology of complex biological processes affecting the total psychosomatic personality.

In the present paper the author investigates the problem of specificity of schizophrenias starting in the period of involution and the involutional modification of schizophrenic processes that had begun at an earlier age.

Analysis of a number of cases related to the first problem shows that they are outstanding by the wealth and variety of their symptomatology and clinical development. This is to say that this heterogeneity manifests itself both on a clinical cross-section and, even more so, in a prolonged observation. Pure schizophrenic pictures in this group are an exception. We see at first a great many depressive elements with a prevailing hypochondriacal coloring, changes in the body image, feeling of the time running short and of an imminent end of personal existence. The latter symptoms may be construed as a direct result and experience of biological changes which may be described as a decrease of vitality. In its turn they may act as a generating nuclear trouble (trouble générateur—Minkowski) for such typical depressive features as the feeling of abandonment and of being wronged and slighted by environment.

In the course of further development other depressive symptoms may appear; the feeling of guilt at first vague and not quite conscious crystallizes into delusions of culpability. The guilt may extend beyond the immediate environment and encompass the entire world. The analogy with the typical schizophrenic delusion of "Welt-Untergang" is obvious.

Changes in the body image may go very far in the direction of deep disintegration. This accounts for delusions of detachment of parts of the body and their exchange with other individuals, symptoms characteristic of schizophrenic transitivism.

An insight into dynamics of many a case shows how both depressive and schizophrenic elements grow out of personality structure. This is, of course, not a characteristic of involutional schizophrenia, however, the connections are here often more manifest and can be easily interpreted in terms of psychoanalytical theory. Changes brought about by involution in the total psycho-somatic personality are taken up and elaborated upon by the ego to produce many symptoms characteristic of these psychoses.

Few examples will suffice to illustrate these connections.

Awareness of imminent loss (or weakening) of sexual capacity activates unconscious castration anxiety which provides an important material for feelings of inferiority, delusions of physical damage extending to various organs and parts of the body. In this way hypochondriacal sensations and delusions may be built up.

With the help of projective mechanisms paranoid delusions come into shape in which the physical damage is being traced to persecutors whose choice reflects repressed hostility or homoerotic libido of the patient. Or else, the persecuting machine may be a projection of the patient's own genital organs which, after being released from the disintegrating body image, become projected according to the mechanism described by Tausk.

Another important elaboration of the experience of sexual inadequacy are delusions of jealousy.

In many cases one has the definite impression that the biological (hormonal?) processes characteristic of involution produce a temporary onrush of libidinal impulses. Repressed drives of genital and sometimes pregenital nature, incestuous wishes become reactivated. The super-ego, put on guard against such an assault of forbidden impulses, mobilizes various defense mechanisms: in hallucinations and delusions

From Dept. of Psychiatry, New York University, College of Medicine.

they are either ascribed to persons in the outside world or repudiated as vicious accusations of slanderous enemies.

In view of such pathoplastic mechanisms it is not surprising that in many a case premorbid personality was characterized psychologically by obsessive features and a phobic structure, biologically by infantilism and intersexuality with latent perversions. The physical build may be typically asthenic even in cases with considerable admixture of depressive features.

Other symptoms atypical of schizophrenia, yet frequently encountered in our patients, consist of dreamy (oneiroid) states with a clouded sensorium and prevalence of optic illusions and hallucinations, delirious states with intense anxiety coloring the pathological perceptions. Such symptoms belonging to the so-called exogenous type as described by *Bonhoeffer* are traceable most likely to some biochemical etiology; past generations of psychiatrists used to speak here of autointoxication. This symptomatology reminds us of "oneirophrenia," a condition described recently by *Meduna* and *McCulloch;* yet among many differential criteria the main ones are the acute onset and good prognosis in their cases, while in our patients the "exogenous" symptomatology is nothing but an addition to the classic symptomatology of the deteriorating dementia praecox. The exogenous symptoms are intermittent in character.

We have never observed one of the classical symptoms of the exogenous symptomatology, namely the amnestic Korsakof's syndrome. However, in some cases we noticed confabulations as one of the important elements of the latter.

Motoric symptoms which enrich the variegated symptomatology of our cases belong to the catatonic series and embrace a wide range between stupor and psychomotoric agitation with all sorts of bizarre hypercinesias. The so-called late catatonias indicate their organic (autotoxic) character by many somatic symptoms and not infrequently, by their fatal outcome. Such observations have been reported by many authors (*Kraepelin, Beyer, E. Meyer, Siemerling, Berger* and *Kreuser*). Symptoms of the exogenous series form an important part of the clinical picture. What German psychiatrists would describe as acute amentia with clouded sensorium and terrifying hallucinations, would be designated by the French as confusion mentale aigue.

If we apply to our cases the principle of longitudinal observation we will be able to distinguish two large groups with different course and outcome.

With advancing age the one group of patients displays more trends of organic psychopathology, their depressions become more rigid, their productivity gets poorer and the disintegration of their personality proceeds rapidly towards a dementia. This dementia then combines trends of a rigid apathetic depression with schizophrenic disintegration and some elements of organic psychopathology.

Another group of patients with a more sthenic personality structure manage to preserve their lively affectivity and a formally relatively intact thinking. Thus their delusions, both of grandeur and persecution, resist the pressure of involution and maintain themselves in full blast. Such cases have been described as paraphrenias of involution. Elements of hypomania can be easily detected both in their general behavior and in their productions. The latter at closer scrutiny reveal mostly slight features of schizophrenic dissociation combined with flight of ideas, external deviability, circumstantiality, sound associations and jocularity.

The latter features are obviously reminiscent of *moria* as observed in syndromes of frontal desinhibition. We have then some reasons to believe that in such cases the involutional process in affecting the highest and the youngest, that is most vulnerable, parts of the brain may produce characteristic clinical pictures.

Such hypomaniacal syndromes are then acquired and not just released from an endogenous background. However, regardless of its origin, the hypomaniacal structure may be instrumental in helping the patient to maintain his aggressively-paranoid and even querulatory attitude. Thus clinical pictures may develop strongly reminiscent of paranoia on the background of hypomania as described by *Specht* and *Ewald.*

Coming to the second point of our inquiry, we can conclude from our observations that there are three different ways in which progressing involution may reflect on schizophrenic symptomatology of long duration. There exists a rather large group of cases in which no changes in clinical picture are observed, even in the patients who reach an advanced age. It may be of interest to notice that in a special investigation concerning itself only with patients who have passed the seventh decade, a half have not shown any influence of the advanced age on their schizophrenic symptomatology (*Jaser*). It is really impressive to observe how in many a schizophrenic patient, no pressure of time affects the rigidity of autistic isolation. It is as if here the schizophrenic succeeded in eliminating any influence of the passing of time on his experience.

In a second group of patients we can observe a gradual addition of organic psychopathology to the schizophrenic picture. The symptoms are at first discrete and can be detected only by special examinations. We may find first disturbances which, to a lesser degree, can be detected in many cases of schizophrenia at a younger age. They have been described by this writer as agnosia and apraxia of thinking, disturbance in categorial thinking and constructive apraxia. These symptoms may not only become more outspoken but in addition other symptoms develop of similar or different, that is more general nature. The former may include such focal symptoms as optic agnosia, finger-agnosia (*Gerstmann*), and other components of a parietal, or, more specifically, angular syndrome. General symptoms pertaining to organic symptomatology include above all disturbance of memory in various shadings and of various intensity. We may find a typical impairment of retention with the gaps filled in by confabulations. However, the latter may be also related to the future (the so-called wishful confabulations described by *Seelert*). Another, the ekphoric function of memory may be disturbed as well, a disturbance which manifests itself in a double way. Firstly we can observe typical organic inlays of rather stereotyped character emerging from older temporal strata and reappearing on the basis of superficial and irrelevant analogies and associations. Second: there is some difficulty in maintaining a definite temporal layer.

Finally, in a third group of cases the changes in the clinical picture brought about by the progressing involution affect the core of the schizophrenic personality.

Old rigidity and autistic isolation break down. Patients become definitely syntonic, show interest in their environment. Their mood becomes more serene, even euphoric and their productions reveal features of a mild flight of ideas combined with organic circumstantiality. Aggressive hostility may diminish, and a patient may still express his paranoid delusions but without much affect and without any tendency toward acting them out.

In parallel to the biological decrease of both erotic and destructive impulses there is a decrease of projective drives which manifests itself in the dynamic depletion of paranoid delusions.

We may interpret these changes in symptomatology as a result of a process of desinhibition caused most likely by atrophic processes developing in the cortex of the frontal lobes. In this way primary syntonia and euphoria become released and interfere with autistic isolation and negativism. Waning of delusions and hallucinations may be interpreted as a result of the release of affects which had been originally bound in these pathological formations. In the course of the pathological process such quanta of affects, isolated from their normal emotional investments, have become the material out of which the symptoms had been built. Now they become released and provide the fuel for a more normal reality cathexis (syntonia).

Two analogies may serve to explain this process of desinhibition brought about by involution.

In neuropathology we may observe that a hemiplegia appearing in the course of a tabes dorsalis may cause the reappearance of kneejerk reflexes. Thus the release of spasticity serves to counteract the effects of hypotonia.

Another analogy is related to changes in personality which may be observed in the course of normal involution. An example

of this is the philosopher Schopenhauer. With advancing age his pessimism and bitter misanthropy yielded to congenial serenity.

Delusions are more symptomatic of schizophrenia, confabulations of organic symptomatology. Yet we may observe delusions in e.g. presbyophrenia, and, on the other hand, we can observe schizophrenics who, after an initial acute outbreak with an admixture of exogenous (autotoxic) symptomatology, develop rapidly an irreversible dementia; in such cases we see a tendency to continuous confabulations not unlike the phantastic paranoia of involution. After all, one could argue that delusions may be considered as fixed confabulations and, vice versa, confabulations may be called transient delusions. Memory defects seem to play a prominent role in the catathymic contents forming confabulations rather than delusions.

As to the disturbance of memory, the impairment of evocation (ekphoria), with the characteristic inability to remain within one temporal layer may be observed in both clinical groups. The same is true for the disturbance of the categorial and constructive function. To be sure, all the latter symptoms of cerebral deficiency are of dynamic character in schizophrenia while in organics they are of a more permanent nature. Yet we know that even in a not too far advanced organic process the deficiency can be overcome by a dynamic act of interest and attention. On the other hand, the study of schizophrenia in the period of involution has shown us that in many cases of long duration, symptoms of deficiency, at first dynamic, may become permanent and irreversible, that is organic.

It is perhaps not as surprising as it might appear at first that a dynamic difficulty in the utilization of certain cerebral functions and of acquired mnemic material (schizophrenia) may produce results resembling a definite weakness of these functions and a deficiency of this material, characteristic of the organic group.

Neurological Clinical Pathological Conference

of the

Cincinnati General Hospital

CHARLES D. ARING, M.D., *Editor*

CASE NO. 273057

Presentation

A 73-year-old married white woman was brought to the Receiving Ward 4½ hours after she suddenly collapsed on March 22, 1951. The only historical data available was that on the evening of admission she was sitting in a chair at a table and slumped from her chair. She fell to the floor striking her chin and cutting the upper lip which bled profusely. She was unresponsive when brought to the Receiving Ward.

The admission physical examination revealed a temperature of 102.4° F., pulse rate of 140 per minute, respirations of 40 per minute, and a blood pressure of 130/70. She was unable to communicate, but the admitting physician felt that she knew where she was. She was able to carry out simple commands in a lethargic fashion. Neurological examination revealed what seemed to be a right hemianopsia as determined by visual threats. Nothing abnormal was seen in the optic discs. Extraocular movements were full and the pupils reacted to light and on convergence. The right corneal reflex was diminished. There was upper motor neuron type weakness of the facial musculature on the right. Gag reflex was absent, however, she was able to cough. The right upper extremity was weak and flaccid; the left had slight tone. The extremities could be moved voluntarily. There was hemihypesthesia on the right as determined by response to pinprick. The deep reflexes on the right were diminished as compared to those on the left, and there was an extensor plantar response on the right. A grasp reflex was obtained on the left.

General physical examination revealed the right leg and thigh to be larger than the left with induration of the calf and the medial aspect of the right thigh. There was increased heat along the greater saphenous channels on the right, and Homan's sign was elicited. All peripheral pulses were readily obtainable. A lumbar puncture was performed on admission. The initial pressure was 270 mm. of cerebrospinal fluid, the pressure after removal of 10 cc. was 170 mm. The fluid was clear and colorless and there was 1 white and 5 red cells per cmm., and 77 mg. of protein in 100 cc. The Wassermann and colloidal gold reactions were negative. The

white count of peripheral blood was 12,500 with 92 per cent neutrophils. The total red count was 4.5 million. Routine examination of the urine was not abnormal.

Roentgen examination of the skull taken 5 hours after the onset revealed a calcified pineal which was shifted 5 mm. to the right hemicranium in the frontal projection but was not shifted downward in the lateral projection.

She was taken to the ward and treated with penicillin and nasal oxygen. On the morning of March 23 the nurses noted convulsive movements involving the right side of the face and the right arm. These movements continued intermittently through the day, and though in a lethargic state she responded to the spoken voice and carried out simple commands. She was placed on Dilantin Sodium. She was unable to swallow, and on the evening of the 23rd she appeared to be breathless and cried out in an incoherent fashion. She had no further convulsive phenomena and seemed to improve slightly. However, her temperature remained elevated (104 to 106 degrees) and pleural effusion developed. This fluid was grossly bloody, 50 cc. being withdrawn. On the 28th she became less responsive than she had been on the previous day and gradually lapsed into coma from which she never roused, dying on March 29, 1951.

Differential Diagnosis

Dr. John Campbell: This patient was an elderly woman who had a sudden cerebral catastrophy followed by transient and partial recovery from left cerebral signs. She developed epilepsy partialis continua and died 7 days after onset.

The past history seems to have been negative. It is of considerable significance that the patient apparently had no prodromata to this acute episode. It is implied, however, that thrombophlebitis must have existed at least 24 to 48 hours prior to the cerebral onset since the examination was done within a few hours of the ictus. She arrived at the hospital with tachycardia and hyperpnea. The normal blood pressure may have been the result of vasodilatation in the periphery. She may have had hypertension prior to the onset, but we cannot be certain. The general physical examination otherwise disclosed right saphenous thrombophlebitis.

The neurological findings included left hemiparesis, hemianesthesia, and hemianopia, anarthria, absent gag reflex, with good bulbar function. She could cough. The only sign suggestive of bilateral involvement was the grasp reflex which, as we know, is a postural reflex, but may be present in patients who are stuporous and have grasping movements. These are not typical grasp reflexes; they would have to be evaluated further upon regaining consciousness. I can't put any diagnostic emphasis upon the grasp reflex in this case. The corneal reflex was reduced on the side of the hemianesthesia. In view of the fact that the left facial weakness was of the central type, we expect active movement of the upper face. A diminished corneal reflex may be found on the side of hemianesthesia; we should not be confused by this supposed peripheral cranial nerve finding. Our patient had no sign of cranial nerve abnormality. Diminished gag reflex and anarthria may be present in acute cerebral episodes without direct involvement of the brain stem; these signs are often transient. We know that she continued to have an anarthria; she understood commands but could not speak. Apparently she did not have a sensory aphasia, and evidence of a motor aphasia is not definite. I cannot say that she had a motor aphasia.

With the sudden onset we must consider the differential diagnosis of cerebral vascular lesions. From the story and without hypertension in the previous history and at onset, and a clear cerebrospinal fluid, we are left without reason for an acute cerebral hemorrhage. I'll postpone discussion of hemorrhage into a tumor until later. A cerebral thrombosis must be considered, but the onset and lack of prodromal signs make me list it as an unlikely possibility. As for an embolism, there is a source; the patient had a thrombophlebitis in the leg. It is within clinical experience to see a cerebral embolism without a pulmonary episode occurring when there are sources for an embolism on the other side of the heart.

A subdural hematoma seems unlikely. She may have been injured when she fell. Subdural hemorrhage might have entered into the differential diagnosis if the history hadn't been so clearly that of falling to the floor and then being weak.

Before we localize the lesion we might discuss the laboratory findings. There was an elevated cerebrospinal fluid pressure with a normal drop in pressure of 100 mm. of water with the removal of 10 cc. and besides

some increase in protein content, the cerebrospinal fluid was normal. The X-rays showed shift of the pineal gland to the right.

Dr. Richard J. Neubauer: By measurement there's no shift of the calcified pineal gland on the lateral views. On the AP view there is a half centimeter shift to the right. The bones of the cranium are normal.

Dr. Campbell: We have to assume, then, with the increased intracranial pressure and the shift of the pineal gland, that there is a space-occupying lesion on the left which is most likely located in the parietal and occipital lobes. A subdural hematoma over the surface or a tumor or other space-occupying lesion near the mid-line could result in these findings. Her course included a bout of Jacksonian epilepsy controlled by Dilantin. The development of bloody pleural effusion would suggest the presence of a pulmonary infarct.

A carotid artery thrombosis seems unlikely. I have never seen a patient with carotid thrombosis without marked involvement of the hand and face and less involvement of the leg. Hemianesthesia, hemianopia, and hemiparesis occur in the thrombosis of the anterior choroidal artery which supplies the lateral geniculate body, the posterior limb and retrolenticular portion of the internal capsule. But this patient had evidence of more widespread involvement. She had cortical irritation as evidenced by the Jacksonian epilepsy, so we can't localize this lesion to the area of supply of the anterior choroidal artery. The branches of the middle cerebral artery are the most common sites for hemorrhage, embolism, or thrombosis to occur, but this patient presents the picture of a space-occupying lesion and focal findings. I believe she had a lesion in the parietal and occipital lobes beneath the cortex, involving by edema or extension the motor cortex to produce the transient epilepsy.

I would differentiate between a cerebral hemorrhage on the basis of hypertension or aneurysm, hemorrhage into a tumor, and an embolism with hemorrhagic infarct. The first has been ruled out because there was no history of hypertension or evidence of subarachnoid or massive bleeding. Cerebral hemorrhage without hypertension or ruptured aneurysm is a rarity. The possibility of hemorrhage into a tumor should be considered, but I feel that the age of the patient argues against it. I cannot say that this patient did not have a left parietal-occipital tumor, but I believe it unlikely. The presence of the thrombophlebitis, subsequent signs and symptoms of pulmonary embolism, and pleural effusion make cerebral embolism a logical diagnosis. The attack that this patient presented, the acute episodes, is compatible with an embolism. The space-occupying lesion, the elevated intracranial pressure, and the pineal shift would make me consider embolism with hemorrhagic infarction and not the so-called anemic infarction. My final diagnosis is thrombophlebitis of the right saphenous vein, pulmonary infarction with bloody pleural effusion, and hemorrhagic infarct due to cerebral embolism in the left parietal and occipital lobes.

Dr. Joseph P. Evans: I wish to raise a diagnostic point. There is a 5 mm. shift of the pineal gland in a film taken within 5 hours of the onset. Would that influence your etiological consideration? In other words, do you think that an acute vascular episode of any sort might produce a pineal shift of this extent without causing more depression of consciousness than this person apparently had suffered? It was possible to determine that she had a hemianopsia, so she must have been alert. I would raise the question whether this might not suggest that there must have been some antecedent difficulty.

Dr. Charles D. Aring: The point is well taken. The films were taken on the way to the ward from the receiving ward. She had collapsed at 6:20 P.M. and was brought to the hospital at 11 P.M., so it was some five hours after the ictus that these roentgen studies were made.

Discussion of Pathology

Dr. Murton Shaver: The autopsy in this case was performed 10 hours after death. The general findings included aspiration pneumonia, which was assumed to be the cause of death, there was pleural effusion and acute esophagitis.

The brain weighed 1370 grams and showed some generalized flattening of the convolutions. At one point over an area of possibly 3 cm. the dura was adherent over the left posterior parietal region. There were adhesions to an underlying mass coming to the cortical surface in the posterior frontal and parietal lobes on the left over an area 3 x 3.5 cm. There were no gross vascular changes anywhere in the central nervous system. There was no shifting of the brain stem or cerebellar pressure cone.

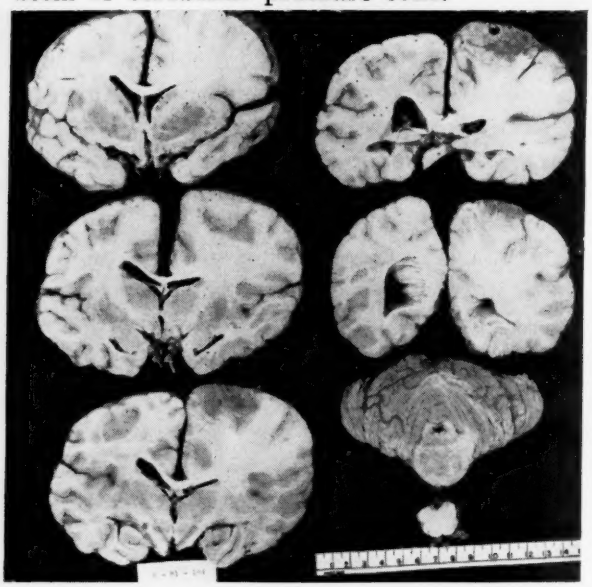


Figure 1: A photograph of several vertical sections of the brain to show: (1) the tumor overlaying the mesial portion of the left fronto-parietal cortex, (2) the widespread edema of white matter of the left cerebral hemisphere, and (3) displacement of the left lateral ventricle downward and toward the right.

In serial sections made coronally through the brain, the mass seen superficially in the parietal region was found to extend to a depth of approximately 3 cm. (Figure 1.) It was brownish grey in color, was not hemorrhagic, but homogenous, firm, and fibrous, and quite definitely demarcated from the surrounding cerebral tissue. It extended laterally from the mid-line for a distance of 4.5 cm., and forward towards the rolandic fissure. Beneath the tumor the white matter was markedly edematous (Figure 1), and there had occurred a shift of approximately 5 mm. of the mesial face of the left frontal lobe to the right under the falx. There was some compression of the left lateral ventricle (Figure 1). The neoplasm in the left parietal region was discreet from the underlying cortex; a capsule could be made out grossly. There were a few minute hemorrhages deep in the parietal lobe posteriorally. Nothing of significance was seen on gross inspection of the brain stem sections; the pons and medulla were apparently normal. The pineal gland was shifted 5 mm. toward the right.

Microscopically the tumor was composed of many vascular channels with a connective tissue stroma; numerous thin-walled vessels with intervening large polygonal cells, with the general appearance suggesting epithelial cells and scattered fibroblasts. There was little calcification. This tumor developed from the dura to which it was adherent. It was an angiomatous type of meningioma. There was relative preservation of the cortical structures. Edema was indicated by widening of the perivascular spaces and slight swelling of the pericellular spaces. On the whole, the nerve cells were well-preserved, and there was no evidence of gliosis of the underlying structures. A few minute hemorrhages were present around some of the vessels. There was nothing of significance in the microscopic sections of the remainder of the brain.

Clinical Diagnosis

Encephalomalacia left cerebral hemisphere, due to thrombosis in left middle cerebral artery.

Pulmonary infarction, right.

Thrombophlebitis of right leg.

Dr. Campbell's Diagnosis

Infarct left parietal-occipital due to embolism.

Thrombophlebitis, right saphenous vein.

Pulmonary infarction.

Pleural effusion.

Anatomical Diagnosis

Meningioma of the angiomatous type, left fronto-parietal.

Edema of the left cerebral hemisphere.

Aspiration pneumonia.

Acute esophagitis.

Dr. Daniel Osher: I believe this case brings up an important point in the handling of stroke. I view every stroke with suspicion which I think is a good policy to follow. You just can't be certain; it is difficult to develop diagnostic acumen sharply enough not to overlook the occasional relievable lesion. With every stroke, I think the first thing

that should be done after the clinical examination is to obtain X-rays of the chest and skull; of the chest because of the possibility of metastatic tumor and of the skull primarily with the hope of finding the pineal gland calcified. With a calcified pineal gland in the mid-line, the odds are greatly against an expanding lesion; there are rare instances where this may not be so. I think it important not to fall into the usual habit of saying, "Well, this patient is not too sick; he has a stroke, it's probably thrombosis," or, "She's fibrillating, it's probably an embolism," or, if he is very sick, "It's obviously a massive hemorrhage." You need to keep constantly thinking of conditions that are relievable and use such diagnostic tests as may corroborate your suspicions.

Dr. Samuel A. Trufant: The reason we choose this case for discussion is because we were impressed that we had not evaluated the problem as it unfolded clinically as critically as we might have done. Critical events were, as Dr. Evans pointed out, the time relationships in the matter of the shift of the calcified pineal gland and the unusual convulsive disorder which persisted for many hours. We see many patients with strokes in this hospital. We see few who have continued seizures for hours beyond the ictus, and particularly rare would be localized fits. These features should assist us toward the correct diagnosis even though the patient be aged.

Dr. Osher: Also the increased cerebrospinal fluid pressure without hemorrhage.

I've seen the pineal gland shifted in massive cerebral infarction due to internal carotid artery occlusion. I don't recall whether the shift occurred early or not. In two cases exploration was done and only grossly softened brain found in every direction, autopsy revealing the occlusion with massive infarction. On occasion increased pressure and shift of a calcified pineal gland occurs incident to the edema of the brain with a massive infarction. This syndrome might simulate tumor.

Dr. Aring: It is unusual to see this amount of swelling with other cerebral lesions unless they be hemorrhagic; it is rather notorious, isn't it, that meningioma does this to white matter?

Dr. Evans: Meningioma in the later stages and metastatic lesions are apt to be associated with considerable swelling of the white matter. There are other infiltrating gliomas that do it also, but such changes will come on slowly, and the brain will compensate until some critical stage is reached.

I couldn't help but wonder as Dr. Shaver was showing those vascular channels in the tumor whether the precipitating factor may not have been some change in the cerebral blood flow in the tumor itself. Studies that Dr. Henry Ryder is carrying on in our laboratory show that the cerebral blood flow is of extreme importance in determining what the intracranial pressure will be. I wonder whether she may have been pushed past her reserve when there occurred some fluctuation in cerebral blood flow.

The edema itself is an extremely important accompaniment and complicates the post-operative care of these people and influences survival rate. If the tumor had been removed at the last possible moment, it is conceivable that this might not have had a satisfactory postoporative course because of the swelling that follows on the removal of such a tumor. On the other hand, had it been picked up at the very start—she survived about a week—it is conceivable that she might have survived because what we see terminally in the way of edema may not have been present initially. The shifted pineal gland may have been due largely to the space occupied by the tumor itself.

Dr. Aring: I want to be certain that the students are clear about the point made by Dr. Evans, that slowly developing lesions within the central nervous system allow for compensation. In such cases we may find no signs whatsoever in a most careful examination. However, in a rapidly developing disorder, there is no time for compensation to occur. In their written discussions the students were prone to belabor lack of historical detail. I don't believe that the history was inadequate in this case. I think we had all the help that the family had to offer. To excuse a diagnostic dilemma by lack of history, I think is often a mistake.

I would reconstruct what happened to our patient in somewhat the same way as did Dr. Evans. Something unusual occurred over and in the cerebrum. Perhaps she had one of her localized fits. These fits were not too obvious. They were rather gentle, Jacksonian seizures, perhaps not enough to attract the attention of her relatives—they didn't attract enough attention on the ward—but enough to discommode cerebral circulation, with spreading abnormality in the cortex. Whatever occurred left her with some hemiparetic disturbance.

Dr. Kurt Tschiassny: I'd like to say a word about pharyngeal reflexes. I made a study of this subject and I found that among 250 patients, 6 had no pharyngeal reflex at all and about 8 or 10 had markedly reduced pharyngeal reflexes. On the other hand there are patients who, when they see the laryngeal mirror and before you touch them, vomit all over you. So, I don't think you can put much weight on these reflexes.

Dr. Evans: The hemianopia has not been explained, has it? Was it a valid heminopia?

Dr. Aring: It was only a lack of reaction to threat. She evidently understood and could cooperate partially in examination, but she could not verbalize. There was lack of blinking on threat from the right, and this was interpreted as possibly indicating a hemianopia.

F. Lyle Gray (Student): Dr. Aring, how do you explain the sudden onset in the presence of neoplasm?

Dr. Aring: She may have had some convulsive manifestations that may have escaped family observation. These convulsions were quite subtle; they involved only the right side of the face and part of the right upper extremity. In the confusion

that may have resulted at the time when she fell, I should think she could have well been convulsing in this manner.

Dr. Shaver: A point has been made concerning rapidity of onset with similar lesions in the cerebellum, whether an angioma or not doesn't matter. I think the same may apply here, a sudden vascular change somehow initiated by the lesion.

Dr. Trufant: This woman had other vascular diseases, there was trouble in the leg, and then she had lung disease; she had systemic disease. We don't know what effect these may have had on cerebral blood flow and circulation. It might have been just enough to tip her out of equilibrium.

Dr. Evans: The point is that people with slow-growing lesions tolerate them very well until they get to the point where they are just on the borderline. A relatively minor episode then may throw them into acute difficulty. I think this is an important point for us to remember clinically because the change for the worse can come very suddenly even with long-standing disease. It happens often with subdural hematoma.

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